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BEFORE THE
POSTAL REGULATORY COMMISSION
WASHINGTON, D.C. 20268–0001

| PERIODIC REPORTING<br>(PROPOSAL FOUR) | Docket No. RM2016-12 |
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**RESPONSES OF THE UNITED STATES POSTAL SERVICE**
**TO QUESTIONS 1-10 OF CHAIRMAN'S INFORMATION REQUEST NO. 2**
(September 30, 2016)

The United States Postal Service hereby provides its responses to Questions 1-10 of Chairman's Information Request No. 2, issued September 23, 2016. The questions are stated verbatim and followed by the response.

Respectfully submitted,

UNITED STATES POSTAL SERVICE

By its attorney:

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**1.** Please refer to Library Reference USPS-RM2016-12/1, folder "Input.Data.Sets."

a. Please confirm that all of the input files (fy10weight, fy11weight, etc.) were created using data from the Transportation Cost System (TRACS) presented in library references 36 from Docket Nos. ACR2010 through ACR2015.

b. If confirmed, please:

i. Identify the TRACS files/worksheets that were used as data sources for the referenced input files; and

ii. Provide the SAS (or applicable other) programs that were used to create these files.

**RESPONSE:**

a. Confirmed.

b. i. The input files are created from the quarterly SAS datasets called sample.sas7bat. These SAS datasets are located in ACR folder 36 (TRACS) (e.g., USPS-FY15-36) in the path Inputs/Highway/pq.

b. ii. The SAS program used to create the input file fy15weight is attached electronically to this response as ChIR.2.Q.1b.Attach.rtf. By changing the value of the 'fy' variable (four times, one for each quarter), this program can also be used to create the input SAS datasets fy12weight, fy13weight, and fy14weight. To use this program to create the input SAS datasets fy10weight and fy11weight, a further small modification is needed. For FY 2010 and FY 2011, the six variables **blowup, cluster, mi, pop, samplingweight,** and **timeseq** need to be removed from the following DROP = data set option that is located near the end of the program.

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Specifically, the SAS statement:

```
set hwydata.fy15weightraw (drop = ACTUDATE blowup cluster COST costcfm EXPRESS Mi OTHER
PALLETS PERWEEK pop ROUTE SACKS SamplingWeight segind timeseg TRIP WHEELED
ZEROVOL);
```

needs to be revised to:

```
set hwydata.fy15weightraw (drop = ACTUDATE COST costcfm EXPRESS OTHER PALLETS PERWEEK
ROUTE SACKS segind TRIP WHEELED ZEROVOL);
```

to create the fy10weight and fy11weight input files.[1] Note that the SAS program has been converted to an RTF format to facilitate electronic filing.

[1] This modification is needed because in FY 2012 TRACS started sampling Vehicle Service Driver (VSD) runs, which resulted in additional variables on the sample SAS datasets filed with ACR folder 36.

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**2.** The Bradley Report at 21 provides the variability equation for capacity with respect to volume. The Bradley Report states: "[t]he dependent variable in that equation could be 'moving capacity' which is the cubic capacity multiplied by trips."

a. Please confirm that moving capacity is calculated as the cubic capacity of the vehicle (Cube) multiplied by the frequency at which the vehicle runs (Trips).

b. If confirmed please describe why Trips were used instead of the route miles that the vehicle traverses (Miles).

c. If not confirmed, please explain how moving capacity was calculated.

**RESPONSE:**

a. Confirmed.

b. In TRACS, the "miles" variable is the leg miles, the distance between the facility at which the test is taken and the immediately preceding facility. This distance is fixed by geography and not affected by volume. As such, the miles variable does not capture actual miles traversed, just the fixed distance. Moreover, the miles variable is set to 1 mile for all Intra-SCF tests, rendering it unusable for that account category. Finally, the Commission's original approach used trips as the dependent variable, assuming that neither cubic capacity nor miles responded to changes in volume. The analysis on page 21 of the Bradley report relaxes the assumption that cubic capacity does not respond to volume, and augments the pure trips dependent variable by multiplying trips by cubic capacity.

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**3.** The Petition at 3 states: "[the dependent variable in [econometric] equations was a measure of transportation capacity." Please confirm that moving capacity discussed in question 2, is applied as a "measure of transportation capacity" in the econometric equations used to estimate capacity-to-volume variabilities. If not confirmed, please explain how a measure of transportation capacity was calculated.

**RESPONSE:**

Confirmed.

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**4.** Please confirm that in the econometric equation used to estimate capacity-to-volume variabilities in the current docket, capacity is defined differently (and/or calculated with a different formula) than it was defined and calculated in the econometric equation used to estimate cost-to-capacity variabilities in Proposal Six, Docket No. RM2014-6.

a. If confirmed, please explain why the variability of cost as the product of two elasticities (cost-to-capacity and capacity-to-volume) will have a reasonable economic meaning (considering that capacity in cost-to-capacity and capacity-to-volume elasticities is defined and/or calculated differently).

b. If not confirmed, please provide additional information (including the formula) showing that capacity in both dockets was calculated using the same formula.

**RESPONSE:**

a. Not applicable

b. Not Confirmed. In both instances, transportation capacity is defined as cubic foot miles (CFM). The formula in Docket No. RM2014-6 is:

$$CFM = CUBE * ROUTE\ MILES * FREQUENCY$$

In the current docket, the formula given on page 21 of the Bradley report is:

$$CFM = CUBE * TRIPS * MILES$$

The "trips" variable in the second definition is a measure of frequency, the number of trips per year. The 'miles' variable in the second definition is the miles per leg rather than the route miles because the TRACS data are taken at the leg level. However, both are measures of transportation distance. The key difference in the use of cubic foot-miles is that it is an independent variable in the cost-to-capacity analysis, but the dependent variable in the capacity-to-volume analysis. In the former case, the analysis

captures how cost responds to variations in cube, route miles, and frequency. Note that because the analysis is done at the contract level, route miles can change due to changes in routings, but not because of changes in the miles between facility pairs. In the latter case, the analysis measures how cubic foot-miles responds to volume changes. In the original Commission approach, that response was limited to changes in trips, holding both cube and miles constant:[2]

> The Commission developed an alternate method to estimate savings using cubic feet of transported mail as the cost driver. This method recognizes that costs are ultimately affected by the amount of transported volume. In general, changes in CF of transported mail can be expected to cause CFM to vary through changes in the number of truck trips. The latter can be expected to vary in the same direction as volume because of service-related concerns.

In the augmented approach both trips and truck cube are allowed to vary. To see the consistency between either of these two approaches and the analysis in Docket No. RM2014-6, first consider the Commission's original approach. That approach assumes the following relationship between cubic foot-miles and trips:

$$\frac{Trips}{CFM} = \rho .$$

[2] See, "Technical Description of PRC Highway Transportation Cost Analyses." PRC-N2010-1-LR5, Docket No. N2010-1at 7.

Now suppose one estimates a regression of cubic foot-miles on volume. It could take the form of:[3]

$$\ln(CFM) = \alpha + \beta \ln(volume) + \varepsilon.$$

In this equation, β is the variability of CFM with respect to volume. The proportionality relationship, provided above, can be used to rewrite the log of cubic foot-miles:

$$\ln(CFM) = \ln(Trips) - \ln(\rho).$$

Substitution for ln(CFM) provides the following equation:

$$\ln(Trips) = (\alpha + \ln(\rho)) + \beta \ln(volume) + \eta.$$

The important point is that estimation of this equation provides an estimate of β, which is the elasticity of cubic foot-miles with respect to volume. The Docket No. RM2014-6 analysis estimated an elasticity of cost with respect to cubic foot-miles. As shown by the above approach, the Commission's original approach, repeated in this docket estimated an elasticity of cubic foot-miles with respect to volume. As a result, the two elasticities are consistent.

In the augmented approach, a similar, but less restrictive assumption is made:

$$\frac{Cube * Trips}{CFM} = \delta.$$

[3] The same explanation holds for the translog equations used to estimate the variabilities used in this proposal.

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Again, suppose one estimates a regression of cubic foot-miles on volume. It could take the form of:

$$\ln(CFM) = \lambda + \gamma \ln(volume) + \varepsilon.$$

In this equation, γ is the variability of CFM with respect to volume. The proportionality relationship, provided above, can be used to rewrite the log of cubic foot-miles:

$$\ln(CFM) = \ln(Cube * Trips) - \ln(\delta).$$

Substitution for ln(CFM) provides the following equation:

$$\ln(Cube * Trips) = (\lambda + \ln(\delta)) + \gamma \ln(volume) + \eta.$$

Again, estimation of this equation provides an estimate of γ, which is the elasticity of cubic foot-miles with respect to volume.

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**5.** The Petition at 3 states that in the econometric equations "the primary independent variable was transported volume." Please clarify how transported volume was defined, and provide the formula used to estimate volume included in econometric equations as the primary independent variable. Please also indicate what data variables included in Library Reference USPS-RM2016-12/1, "Input.Data.Sets," were used to calculate the transported volume.

**RESPONSE:**

Transported volume is the amount of mail moved over a year, and it is measured as the mail volume space on a truck times the annual trips the truck runs. In TRACS, truck space is measured in three ways, the space occupied by the mail that is unloaded (UM), the space occupied by the mail that remains on the truck (RM), and the empty space (ES). The sum of these three variables is total truck capacity (CAP):

$$CAP = UM + RM + ES.$$

Transported volume (TV) is unloaded mail space plus remaining mail space times annual trips, or, equivalently, capacity minus empty space times annual trips:

$$TV = (UM + RM) * Trips.$$

This can be converted into a computationally convenient version with a little algebra. First multiply the parenthetical expression by one, expressed as the ratio of capacity to capacity:

$$TV = \frac{CAP}{CAP}(UM + RM) * Trips.$$

This can be simplified to show:

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$$TV = CAP * \left(\frac{UM + RM}{CAP}\right) * Trips.$$

In terms of variables included in USPS-RM2016-12/1, this is expressed as:

$$TV = Capacity * (Per\_Mail\_Volume) * Trips.$$

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**6.** The following questions concern the explanatory variables in the econometric equation used to estimate capacity-to-volume variabilities.

a. Please confirm that the econometric equation used to estimate capacity-to-volume variabilities does not include the number of sampled mailpieces (recorded in TRACS) as an explanatory variable.

b. If confirmed, please explain why the model specification does not include the number of mailpieces, and whether or not the number of mailpieces could be used to estimate the capacity-to-volume variabilities.

c. If not confirmed, please explain how the econometric model used to calculate capacity-to-volume variabilities accounts for the number of mail pieces.

**RESPONSE:**

a. Confirmed.

b. As explained in the response to Question 5 of this Information Request, in TRACS, truck space is divided into three categories, unloaded mail, remaining mail, and empty space. In addition, TRACS samples a subset of unloaded containers. For each sampled container, an item of each type on that container (letter tray, flat tub, sack, etc.) is sampled. For each item type sampled, the pieces are counted by product. This means that TRACS produces piece counts for just a subset of the unloaded mail, and no piece counts for the mail that remains on the truck. Because the TRACS piece count does not provide a measure of the total volume on the truck, it does not provide an acceptable variable for estimating the capacity-to-volume variabilities.

c. Not applicable.

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**7.** The response to Chairman's Information Request No. 1 (CHIR No. 1), question 1c, states: "[d]ata cleaning involved removing observations that had defects that disqualified them from use." *See* Responses of the United States Postal Service to Questions 1-9 of Chairman's Information Request No. 1, September 13, 2016 (Response to CHIR No. 1). By each transportation type (*i.e.,* Intra-SCF, Inter-SCF, etc.), please indicate the percentage of disqualified/excluded observations.

**RESPONSE:**

The analysis of the potential usefulness of the TIMES/SV data was done in the 2010-2011 period. Because it was determined that the approach did not meet Commission standards, the approach was abandoned, no report was prepared, and the econometric exercise was not formally documented. Thus, a precise answer to this question is not available. However, the proportion of excluded observations was at least 30 percent and could have ranged as high as 45 percent. Observations were excluded before the data were segregated by account category, so the requested percentages are not available by that breakout.

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**8.** The Response to CHIR No. 1, question 5b, states: "[t]here is not a single Postal Service data set that includes data on cost, capacity, and volume…." Please specify what data needed to produce the cost-to-capacity variabilities are not available in TRACS.

**RESPONSE:**

Purchased highway transportation is acquired through a bidding process in which the Postal Service specifies the requirements (like the cubic foot-miles) of a contract, and potential contractors then bid an annual amount to provide the transportation specified in the contract. To estimate the variability of cost with respect to cubic foot-miles of capacity, one needs to relate the actual annual costs for various contracts to the cubic foot-miles specified on those contracts.

It is true that TRACS contains a cost measure, but that is just the estimated cost for one leg, on one of potentially many routes, on the covering contract. Also, the estimated leg cost reflects the overall annual contract cost and does not relate directly to the volumes being carried on that leg. Thus, those costs may be caused by other routes or capacities besides the one being tested in TRACS. In sum, the TRACS cost variable does not provide the information required for estimating a cost-to-capacity variability.

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**9.** The Response to CHIR No. 1, question 6b, states: "[t]he translog specification has also been successfully used in previous transportation analyses." Please identify the Commission dockets where the translog specification of the econometric model was used for transportation analysis.

**RESPONSE:**

Please see the following dockets: Docket Nos. R87-1, R97-1, R2000-1 and RM 2014-6.

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**10.** The Response to CHIR No. 1, question 9, describes the MAIL_VOLUME_CUBE variable as "[a]nnual mail volume space found as mail volume cube times the number of trips per year." Please indicate how "mail volume" referred to in the above statement is calculated. Please include the applicable formula and provide reference to the TRACS worksheets.

**RESPONSE:**

Mail volume space in the above statement is the space for the mail that is unloaded (UM) plus the space for the mail that remains on the truck (RM). The formula for calculating it is:

$$Mail\ Volume\ Space = UM + RM\ = \left(\frac{UM+RM}{CAP}\right) * Cap.$$

Within the TRACS folder USPS-FY15-36, SAS dataset sample.sas7dbat, unloaded mail space and remaining mail space are expressed as proportions between zero and one hundred. In terms of TRACS variables, mail volume space would be expressed as:

$$Mail\ Volume\ Space = \left(\frac{Unloaded + Remain}{100}\right) * Capacity.$$